REMARKS

The Office Action of September 5, 2007 has been received and its contents carefully considered.

The present Amendment revises the claim to improve their form under US claim-drafting practice. Claims 1-18 are pending in this application, with claims 1 and 4 being independent.

Claim 1 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig et al (US patent 7,154,854) in view of Yao et al (US patent 6,097,697), Agarawal et al (US patent 6,434,191), and Cheng (US patent 6,745,352), hereafter referred to as "Zweig," "Yao," "Agarawal," and "Cheng," respectively. It is submitted that independent claim 1 is patentable over the cited references for at least the following reasons.

In order to properly support an obviousness rejection under 35 U.S.C. §103, there must have been some teaching in the prior art to suggest to one skilled in the art that the claimed invention would have been obvious. W. L. Gore & Associates, Inc. v. Garlock Thomas, Inc., 721 F.2d 1540, 1551 (Fed. Cir. 1983).

Claim 1 recites a method for transmission rate adaptation used in a wireless network. A current transmission rate is selected from a set of predetermined transmission rates, and each of the predetermined transmission rates R is associated with a PER (packet error rate) range, which includes a predetermined threshold pair of a high PER threshold, denoted as $Q_H(R)$, and a low PER threshold, denoted as $Q_L(R)$. First, a *first number* **N1** and a *second number* **N2 are determined** *according to the* **$Q_H(r_n)$ and the $Q_L(r_n)$, respectively**, wherein N1 and N2 are positive integers, r_n denotes the current transmission rate, and the subscript n denotes an adaptation iteration index. Then, a first plurality of packets are transmitted, wherein the number of the first plurality of packets is N1. Next, a first plurality of acknowledge packets are received, with each one in the first plurality of acknowledge packets responding to one of the first plurality of packets, wherein the number of the first plurality of acknowledge packets is A1, wherein A1 is a positive integer and A1<=N1, and wherein a **first estimated PER, denoted as $P1(r_n)$, corresponding to the current transmission rate is $P1(r_n)=(N1-A1)/N1$. The transmission rate is reduced if the $P1(r_n)$ is larger than the**

$Q_H(r_n)$. Following that, a second plurality of packets are transmitted, wherein the number of the second plurality of packets is (N2-N1). Afterward, a second plurality of acknowledge packets are received, with each one in the second plurality of acknowledge packets responding to one in the second plurality of packets, wherein the number of the second plurality of acknowledge packets is A2 and A2<=(N2-N1), and wherein **a second estimated PER, $P2(r_n)$, corresponding to the current transmission is $P2(r_n)$=(N2-A1-A2)/N2**. **The transmission rate is reduced if the $P2(r_n)$ is larger than the $Q_H(r_n)$, and is increased if the $P2(r_n)$ is smaller than the $Q_L(r_n)$**. The transmission rate kept the same if the $P2(r_n)$ falls between the $Q_H(r_n)$ and the $Q_L(r_n)$, wherein the numbers N1 and N2 are large enough such that the $P1(r_n)$ and the $P2(r_n)$ are substantially reliable.

In contrast, Zweig discloses an AP (access point) of a wireless network system which automatically determines a factor indicative of the error(s) that occurred in the transmission of the one or more data packets to a WU (wireless unit) and automatically adjusts the fragmentation threshold in accordance with the transmission error factor (see column 8, lines 4-9).

Zweig fails to disclose or suggest that a first number N1 and a second number N2 are determined according to ***a high PER threshold $Q_H(r_n)$*** and ***a low PER threshold $Q_L(r_n)$***, respectively, or that a first estimated PER $P1(r_n)$=(N1-A1)/N1 and a second estimated PER $P2(r_n)$=(N2-A1-A2)/N2. Zweig also fails to disclose or suggest that *the transmission rate* is reduced if $P1(r_n)$ is larger than the $Q_H(r_n)$, that *the transmission rate* is reduced if $P2(r_n)$ is larger than the $Q_H(r_n)$, and that *the transmission rate* is increased if the $P2(r_n)$ is smaller than the $Q_L(r_n)$, as recited in claim 1.

Instead, Zweig discloses that the AP first transmits ***one or more data packets*** to one or more associated WU(s) and determines a factor indicative of the error(s) that occurred in the transmission of the one or more data packets to the WU(s) (see column 8, lines 24-29 and Figure 4). ***The fragmentation threshold*** (the upper limit of the data portion of a packet, defined at column 2, lines 27-29) is reduced if the (transmission error) factor is above the upper threshold and is increased if the factor is below the lower threshold (see column 8, lines 41-61 and Figure 4).

The Office Action acknowledges that Zweig fails to teach that the adapting transmission parameter is the transmission rate, and determining a first and second number according to a PER upper and lower thresholds, and points to Yao as teaching a component that adapts the transmission rate based on multiple indicators including packet loss.

However, Yao discloses two network nodes 110A and 110B that are coupled through a data network 100 and each of the network nodes 110A and 110B includes a rate controller 116 used to limit the rate that packets are sent over a connection between applications on the network nodes 110A and 110B (see column 4, lines 8-11 and Figure 1). Yao fails to disclose that <u>a first number N1 and a second number N2 are determined according to a high PER threshold $Q_H(r_n)$ and a low PER threshold $Q_L(r_n)$, respectively</u>, <u>or that a first estimated PER $P1(r_n)=(N1-A1)/N1$</u> and <u>a second estimated PER $P2(r_n)=(N2-A1-A2)/N2$</u>, as recited in claim 1. Instead, Yao discloses that <u>a sequence of dP=17 packets 200, sent by one node to another,</u> includes successfully received packets 210 and dL=6 loss or damaged packets 212 (see column 4, lines 23-27 and Figure 2). Thus, Yao fails to overcome the deficiency of Zweig as mentioned above.

The Office Action further points to Agarawal as teaching a component that uses the BER to adaptively determine the number of packets to send in a packet sequence over a path, and assets that it would be obvious to one skilled in the art at the time of the invention to combine the invention of Agarawal with the invention of Zweig.

However, Agarawal discloses that a mobile terminal 401 including a Send Adaptation Agent (SAA) 423 is transceiving with a base station 402 (see column 5, lines 56-63 and Figure 4A). SAA 423 uses **the BER** (bit error rate) to adaptively determine the number of packets to send in a packet sequence over the wireless path 403 and the amount of forward error correction to be used in each packet of the packet sequence so as to <u>**maximize the expected number of packets delivered correctly over the wireless path 403**</u> (see column 6, lines 28-34).

Agarawal fails to disclose that <u>the transmission rate is reduced if the first estimated PER $P1(r_n)$ is larger than the $Q_H(r_n)$</u>, and that <u>the transmission rate is reduced if the second estimated PER $P2(r_n)$ is larger than the $Q_H(r_n)$ and is increased if the $P2(r_n)$ is smaller than the</u>

$Q_L(r_n)$. Agarawal also fails to explicitly disclose (or even to suggest) that **a first number N1 and a second number N2 are determined according to *a high PER threshold $Q_H(r_n)$* and *a low PER threshold $Q_L(r_n)$*, respectively**, or that **$P1(r_n)=(N1-A1)/N1$** and **$P2(r_n)=(N2-A1-A2)/N2$**, as recited in claim 1. Thus, Agarawal fails to overcome the deficiency of Zweig as mentioned above.

Moreover, it is respectfully submitted that, considering the applied art as a whole, there is no motivation to include a redundant step of using the BER to adaptively determine the number of packets to send in a packet sequence, suggested by Agarawal, which aims to maximize the expected number of packets delivered correctly over the wireless path, in Zweig's AP, which automatically adjusts the fragmentation threshold to increase data throughput, except in a hindsight attempt at reconstructing Applicants' claimed invention. This is especially evident by the failure of the Office Action to identify a reference teaching this claimed feature, and the lack of any motivation provided by any of the cited references for such a combination.

Cheng discloses that a receiver iteratively processes each of a plurality of successively received symbol sequences to provide a respective plurality of data sequences (block 51). For each data sequence provided, a number of iterations performed to provide the data sequence is provided (block 53), and the number of iterations performed is used to estimate an error rate for received communications (block 55) (see column 5, lines 1-8 and Figure 5). Like the other secondary references, Cheng fails to overcome the deficiency of Zweig as mentioned above.

Considered as a group, none of Zweig, Yao, Agarawal and Cheng contains any suggestion (express or implied) that they can be combined to arrive at the claimed invention (see MPEP 2143). Each of the cited references is complete and functional in itself, so there would be no reason to add or substitute parts to any of the cited references. It clearly would not have been obvious to a person skilled in the art to make such a modification. Further, the Zweig, Yao, Agarawal and Cheng references, even combined, would not produce the invention defined by claim 1. Therefore, it is respectfully submitted that claim 1 is patentable over the cited references and the rejection of claim 1 should be withdrawn.

Claim 2 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Yao, Agarawal, Cheng, and in further view of Varma et al (US patent 6,643,322), hereafter referred to as "Varma." It is submitted that claim 2, dependent from claim 1, is patentable over the cited references for at least the following reasons.

Varma discloses determining a measure of errors by monitoring a number of no-acknowledgment (NACK) messages and a number of acknowledgment (ACK) messages that occur for a wireless communication link (column 6, lines 18-22 and Figure 5). Varma fails to overcome the deficiency of Zweig as mentioned above, and thus a combination of the Zweig, Yao, Agarawal, Cheng and Varma references does not produce the invention defined by claim 1. Therefore, it is respectfully submitted that claim 2 is patentable over the cited references and the rejection of claim 2 should be withdrawn.

Claim 3 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Yao, Agarawal, Cheng, and in further view of Tanigichi et al (US patent 6,445,679), hereafter referred to as "Tanigichi." It is submitted that claim 3, dependent from claim 1, is patentable over the cited references for at least the following reasons.

Tanigichi discloses a real time stream transmission system comprising a transmission node 11, a relay node 12, a reception node 13, and a network 14 to which the nodes are connected (see column 7, lines 23-28 and Figure 1). Tanigichi fails to overcome the deficiency of Zweig as mentioned above, and thus a combination of the Zweig, Yao, Agarawal, Cheng and Tanigichi references does not produce the invention defined by claim 1. Therefore, it is respectfully submitted that claim 3 is patentable over the cited references and the rejection of claim 3 should be withdrawn.

Claims 4 and 11 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi. Claim 4 is an independent claim that includes limitations similar to claim 1, and thus it is submitted that claim 4 (as well as claim 11 dependent therefrom) is patentable over the cited references for the same reason that claim 1 is patentable.

Claims 5, 7 and 9 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi, and in further view of Cheng, and claims 6, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi and

Cheng, and in further view of Varma. However, claims 5-10 depend directly or indirectly from claim 4, so they are automatically patentable along with claim 4.

Claims 12-14 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi, and in further view of Kilkki et al (US patent 6,011,778), Huang et al (US patent 7,145,876), Amirijoo et al (US patent 6,728,217), and Sano et al (US patent 6,246,735). Furthermore, claim 15 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi, Kilkki, Huang, Amirijoo, Sano, and in further view of Barazeche et al (US patent 4,577,309); claim 16 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi, Kilkki, Huang, Amirijoo, Sano, Barazeche, and in further view of Ghahramani (Saeed Ghahramani, Fundamental of Probalbility-2nd ed., 2000, Prentice-Hall, Inc., Upper Saddle River, NJ); and claims 17 and 18 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Zweig in view of Tanigichi, Kilkki, Huang, Amirijoo, Sano, and in further view of Bringby et al (US patent 6,285,883). These claims all depend directly or indirectly from independent claim 4, and recite additional limitations to further define the invention of claim 4, so they are automatically patentable along with claim 4 and need not be further discussed

For the foregoing reasons, it is respectfully submitted that this application is in condition for allowance. Reconsideration of the application is therefore respectfully requested.

Respectfully submitted,

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